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09/696,956	10/27/2000	Daniel E. Fisher	001.00001	3189

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EXAMINER	
CHOW, CHARLES CHIANG	
ART UNIT	**PAPER NUMBER**
2685	

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,956	FISHER, DANIEL E.	
	Examiner	Art Unit	
	Charles Chow	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *16, 22 are canceled* is/are withdrawn from consideration.

5)☒ Claim(s) *3-8,18,19 and 21* is/are allowed.

6)☒ Claim(s) *1,2,9,10,17,20 and 23-28* is/are rejected.

7)☒ Claim(s) *11-15 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed *Action*

1. This office action is for Amendment Received on 1/3/2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (US 3,816,834) in view of Janc et al. (US 4,893,316).

Regarding **claim 1,** Wilson teaches a receiver [Fig. 2, abstract] comprising an RF bridge [6, 14, 12 & associated circuits] coupled to receive a reference signal [receiving 1 MHz reference signal from Master low frequency 18, Fig. 2; Holler teaches the processor in below].

the rf bridge including first and second frequency converters [the first mixer converter 6, the second mixer converter 14] coupled to respective first and second antennas [antennas 4, 5]; and

a third frequency converter [12] coupled to outputs of the first and second frequency converters [12 coupled to the outputs of the mixers 6, 14, Fig. 2],

Wilson teaches the master oscillator 18 is coupled to the rf bridge via phase detector 35, but fails to teach a processor in 18 to couple to the rf bridge, and fails to teach the reference signal being characterized by a constant predetermined frequency [page 10 of applicant's amendment, to distinguish from tunable radio sets]

However, Janc et al (Janc) teaches a digital frequency source 1976/626 having processor for replacing Wilson's 18. The digital frequency source 1976/626 for generating reference signal cos $2\pi fcnT$/sin $2\pi fcnT$ from a clock signal to 644 and

the processor in Fig. 6 processing clock & input information for generating the reference signals cos 2πfcnT/sin 2πfcnT which is being characterized by a constant predetermined frequency clock source 1934, clock signal to 648], for generating the accurate, stable local oscillator signal [col. 11, lines 1-5]. Therefore, it would have been for one of ordinary skill in the art at the time of invention to upgrade Weckstrom with Janc's accurate local oscillator signal utilizing digital frequency source 1976 & clock 1934, in order to generate accurate, stable, local oscillator signals.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of Holler, as applied to claim 1 above, and further in view of Weckstrom (US 6,268,829 B1).

Regarding **claim 2,** Wilson & Holler fail to teach the further features for this claim. Weckstrom teaches the third frequency converter 68 [Fig. 8] provides an information signal via 82, 86, to couple to the processor DSP 198 [Fig. 8, col. 9, lines 28-45], for locating mobile station [col. 11, lines 49-65], via DPS 198 [col. 12, lines 36-58]. Therefore, it would have been for one of ordinary skill in the art at the time of invention to upgrade Wilson & Holler with Weckstrom's DSP 198, in order to locate mobile station.

4. Claims 9, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weckstrom (US 6,268,829 B1) in view of Janc et al. (US 4,893,316).

Regarding **claims 9, 27,** Weckstrom teaches a receiver [Fig. 8] comprising an rf bridge [78, 60, 68 & associated circuitry in Fig. 8], and

a processor [DSP in 198] coupled to the rf bridge to receive an information signal from the rf bridge [receive information signal from rf bridge via 86];

the circuitry [68] to detect a frequency difference from the information signal based on the signal from the frequency source [the mixer 68 detect frequency

difference +/- df at 68, col. 9, lines 1-45; based on crystal 66 in col. 8, lines 15-35, for accurate location of mobile location in col. 11, lines 49-65].

Weckstrom fails to teach a digital frequency source to generate a reference signal based on a signal from a clock source; the using the signal from the clock source, and the detection of information signal based on, or using, the signal from the clock source.

Janc et al. (Janc) teaches these features, the digital local oscillator 1976/626, which is the digital frequency source using the clock source 1934, and the 626 digital frequency source is in Fig. 4/Fig.6 [col. 5, lines 47-48 & col. 6, lines 11-12; col. 11, lines 1-23], for generating local oscillator signals to mixers 1922/1924, Fig. 19 [col. 20, lines 17-65], and the demodulator 1982 circuitry detects the information signal from mixers 1922/1944, based on, using, the clock source 1934/clock", [Fig. 19, col. 20, lines 48-20], in order to generate accurate frequency of local oscillator signals for the mixing process [col. 11, lines 1-5]. Therefore, it would have been for one of ordinary skill in the art at the time of invention to upgrade Weckstrom with Janc's clock source 1934 for the digital frequency source 1976, in order to generate accurate local oscillator signals for the mixing process.

5. Claims 10, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weckstrom in view of Janc, as applied to claim 9 above, and further in view of Masheff (US 4,876,549).

Regarding **claim 10,** Weckstrom & Jane fail to teach the fourier transform. Masheff teaches wherein the circuitry to detect includes a first Fourier transform 56 having a first center frequency [receiver channel frequency, abstract]; and

a second Fourier transform 58 having a second center frequency, the first center frequency being different from the second center frequency [abstract; different frequency channels in col. 5, lines 31-35], in order to accurately determine

the angle of arrival digital from the transformed signals 70-76 [col. 5, lines 28-39]. Therefore, it would have been for one of ordinary skill in the art at the time of invention to upgrade Wilson with Masheff's first, second Fourier transform, in order to accurately determine the angle of arrival digital from the transformed signals.

Regarding **claim 26**, Masheff teaches the circuit to detect includes a first Fourier transformer 56 characterized by a first center frequency and a second Fourier transformer characterized by a second center frequency, the first center frequency differing from the second center frequency by a predetermined frequency difference [the two different receiver channels in abstract; different frequency channels in col. 5, liens 31-35; the predetermined channel frequency difference of the two different receiver channel].

6. Claims 17, 20, 23, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of Masheff-'549.

Regarding **claim 17**, Wilson teaches a method comprising capturing a frequency difference that is present at first and second antennas [the captured frequency difference of antenna signal at antenna 4, & at antenna 5, col. 2, lines 59-65], producing an information signal onto which the frequency difference has been modulated [the frequency difference at the output of mixer 12 is modulated onto 1 MHz, Fig. 2].

Wilson fails to teach the forming a first Fourier transform of the information signal at the first center frequency; and forming a second Fourier transform of the information signal at a second center frequency, the second center frequency being different than the first center frequency.

Masheff teaches these features [the first and second Fourier transform 56, 58, Fig. 2, the different receiver frequency channels in abstract & col. 5, lines 31-35], in order to accurately determine the angle of arrival digital from the transformed signals 70-76 [col. 5, lines 28-39]. Obviously, it would have been for one of ordinary skill in the art at the time of invention to upgrade Wilson with Masheff's first, second Fourier transform, in order to accurately determine the angle of arrival digital from the transformed signals.

Regarding **claim 20**, Weckstrom teaches a step of determining a range [the determining the range distance, col. 3, line 62 to col. 4, line 2] between an emitter, mobile station, generating a signal and a point between the first and second antenna [the point between antenna element 52].

Regarding **claim 23,** Weckstrom teaches the determining a range distance [the determining the range distance, col. 3, line 62 to col. 4, line 2, in the step for the determined location information for a mobile station], in combination with Masheff's first and second Fourier transforms, for accurately determine the range location information using digital information from the Fourier transform.

Regarding **claim 28**, Masheff teaches the wherein the first center frequency differs fro the second center frequency by a predetermined frequency difference [the receiver channel frequency difference, abstract, col. 5, lines 31-35].

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of Janc, as applied to claim 1 above, and further in view of Stone et al. (US 3,680,124).

Regarding **claim 24**, Wilson & Janc fail to teach the additional features of this claim.

Stone et al. (Stone) teaches the reference signal is coupled to only one of the

first and second frequency converters [the reference signal 35, in Fig. 5, is coupled only to mixer 31 of the phase measuring interferometer system], in order to separate the frequency to mixer 31, 33 by a desired amount [col. 26-40]. Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention to upgrade Wilson & Holler, with Stone's reference coupled only to one mixer, in order to separate the frequency to different mixers by a desired amount.

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stone et al. (US 3,680,124) in view of Weckstrom-'829 B1

Regarding **claim 25,** Stone et al. teaches a receiver [Fig. 5] comprising an rf bridge 31, 33, 41 & associated circuitry], the rf bridge including

first and second converters [31, 33] coupled to the respective first and second antennas [27, 29],

the reference signal being coupled to only one of the first and second frequency converters [the reference signal 35 is coupled to only frequency converter 31 which is different from the reference signal 39 via phase shifter 47 to 33 in Fig. 5, col. 7, lines 35-55],

Stone fails to teach an rf bridge coupled to the processor to receiver reference from the processor; the third frequency converter coupled to the output of the first and second frequency converters.

Weckstrom teaches these features, the processor DSP 198 coupled to the down converter 78, 60 of the rf bridge [78, 60, 68 & associated circuitry], for receiving reference signal from PLL 199, crystal 66 via control from processor DSP 198 [Fig. 8, col. 12, lines 49-58], the third frequency converter [68] coupled to the

output of the first and second frequency converters [mixer 78, 60], in order to controlling the channel for down conversion of the received signal. Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention to modify Stone with Weckstrom's processor controlled reference signal to frequency converter, in order to control the channel for down conversion.

Allowable Subject Matter

9. Claims 3-8, 18-19, 21, are allowable over the prior art of record.

The following is the examiner's statement for the reasons of allowance:

Claims 3-8, 18-19, 21 are allowable over the prior art of record, which has mailed out in the previous office action, that the prior arts fail to teach singly, particularly, or in combination, the subject matter, for the **structures** in **claims 3, 5, 6, 21** and the features for the **wherein the integration interval is inversely proportional to a difference between the first center frequency and the second frequency in claim 18**; the **digital frequency source to generate a reference signal** using a signal from a clock source in **claims 9, 27**.

The dependent claims 4, 7-8, 10-15, 16, 29 are also allowable due to their dependency upon the independent claims and having further claimed features.

The closest prior art to **Johnson (US 4,245,220)** teaches the first, second, third frequency converters having two antennas for calculating the frequency difference to determining the target location (abstract, frequency different Af x (t/T) in col. 2, lines 7-16; the analyzing using processor for the signals from filter bank; col. 2, lines 54-600; the frequency difference in col. 3, lines 55-60; £f in col. 2, line 61 to col. 3, line 5). Johnson fails to teach the **structures** in claims 3, 5-6, and the where the **integration interval is inversely proportional to a difference** between the first center frequency and the second frequency.

Wilson (US 3,816,834) & Weekstrom (US 6,268,829 B1) as shown in office action above, are also considered, they fail to teach the above allowable features.

Other prior arts are considered but they fail to teach the above allowable features.

Masheff (US 4,876,549) teaches the control circuit 60 for generating clock pulses on line 62 for the direction finding apparatus [abstract, Fig. 2, col. 5, lines 4-39], but fails to teach the **digital frequency source** to generate a reference signal.

Stone (US 3,680,124) teaches the determining of the azimuth information from the signal difference from antennas 27, 29 [Fig. 8], the first, second frequency converter 65, but failed to teach the fourth frequency converter & the additional up converter/down converter coupled to the rf bridge and processor, having first, second Fourier transform center frequency.

Cash (US 4,509,052) teaches the interferometer/Dopper target location system (abstract, 1-6), frequency converters 10/12, for measuring elevation angle, azimuth angle and range (abstract, summary of invention, his claims 1, 10), the processor 34 to analyzer frequency difference according to equations (col. 7, lines 3-24).

DesJardins (US 5,570,099) teaches the accurate range and frequency calculation FDOA, using digital signal processing, Hilbert transforms, FIR filters, to analyzing two antenna received signals, to locating a transmitter (abstract, Fig. 1-3, col. 3, liens 35-59; col. 2, line 65 to col. 3, line 25; col. 5, lines 37-45; col. 3, lines 17-31).

Reference, **Carr et al. (US 4,845,502), Masheff (US 4,876,549), Herrmann et al. (US 6,313,79 B1), Morita (US 5,355,767), Kasperkovitz et al. (US 6,784,836 B2), Houghton et al. (US 5,955,993), Kushihara (US 5,796,357), Mruphy et al. (US**

5,541,608), Timothy et al. (US 6,366,240 B1), Parl et al. (US 6,259,404 B1), Jones et al. (US 6,392,598B1), Storey Jr. (US 4,771,290), Janc et al. (US 4,893,316), are considered but failed to teach the above allowable features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims Objection

10. Claims 11-15, 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art fails to teach the digital frequency generator that generates a second digital signal at the second center frequency coupled to the second Fourier transform in claim 11; the frequency discriminator coupled to the first and second Fourier transformers in claim 12; the structure & shifting of the frequency of information signal to a frequency in between the first & second center frequency in claim 13. The combining of Wilson to Weckstrom & Jane is failed to provide a reason, that the first and second frequency converter respectively coupled to the first and second antennas in claims 14-15. The cited references fail to teach the structure of the rf bridge having a fourth rf frequency converter in claim 29.

Response to Argument

11. Applicant's arguments with respect to claims 1-15, 17-21, 23-29 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's amendment & adding new claims 25-29, based upon no teachings for the reference signal being characterized by a constant predetermined frequency; a digital frequency source to generate a reference signal based on a

signal from a clock source; the using the signal from the clock source, and the circuitry to detect information signal based on, or using the clock source; the DesJardins fails to teach the Fourier transform.

Regarding the reference signal being characterized by a constant predetermined frequency; a digital frequency source to generate a reference signal based on a signal from a clock source; the using the signal from the clock source, and the circuitry to detect information signal based on, or using, the clock source,

Janc et al. (US 4,893,316) teaches the reference signal, cos 2πfcnT/sin 2πfcnT, from digital frequency source, quadrature local oscillator 1976/626 in Fig. 6, characterized by a constant predetermined frequency clock 1934/clock to 648. Janc also teaches the digital local oscillator 1976/626, which is the digital frequency source, uses the clock source 1934, and the 626 is in Fig. 4/Fig.6 [col. 5, lines 47-48 & col. 6, lines 11-12; col. 11, lines 1-23], for generating local oscillator signals to mixers 1922/1924, Fig. 19 [col. 20, lines 17-65], and the demodulator 1982 circuitry detects the information from mixers 1922/1944, based on, using, the clock source 1934/clock", [Fig. 19, col. 20, lines 48-20].

Regarding DesJardins fails to teach the Fourier transform, **Masheff (US 4,876,549)** teaches the discrete Fourier transform 56, 58, Fig. 2, for converting signal on two different receiver channels in abstract; different frequency channels in col. 5, liens 31-35] having channel frequency difference, for the direction finding from antennas 40, 42.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow CC.

March 6, 2006.

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